EFFECTIVENESS OF ORAL GLUCOSE ON PAIN DURING IMMUNIZATION AMONG INFANTS AT CHILD HEALTH CLINIC, TRICHY.

By

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A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R. MEDICAL UNIVERSITY, CHENNAI IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE IN NURSING

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EFFECTIVENESS OF ORAL GLUCOSE ON PAIN DURING IMMUNIZATION AMONG INFANTS AT CHILD HEALTH CLINIC, TRICHY.

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TO WHOMSOEVER IT MAY CONCERN

This is to certify that the Ethical committee of Dr. G. Sakunthala College of Nursing has discussed with its members about the topic "A true experimental study to assess the effectiveness of oral glucose on pain during immunization among infants at Child Health Clinic, Trichy" during the year 2015-2016 opted by **Ms. NAMITHA MUNIPASS** and its implication on study subjects for her thesis for M.Sc. Nursing programme and the committee passed clearance for the same topic for her to pursue.

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STATEMENT OF THE PROBLEM

A true experimental study to assess the effectiveness of oral glucose on pain during immunization among infants at Child Health Clinic, Trichy, 2015-2016.

OBJECTIVES

1. To assess the level of pain during immunization among infants in control group.
2. To evaluate the effectiveness of oral glucose administration on level of pain during immunization among infants in experimental group.
3. To compare the level of pain during immunization among infants in control group and experimental group.
4. To determine the association between selected demographic variables with level of pain during immunization among infants in control group.
5. To determine the association between selected demographic variables with level of pain during immunization among infants in experimental group.

HYPOTHESIS

H_1 : There will be a significant difference on level of pain during immunization among infants in experimental group as compared to control group.

H_2 : There will be a significant association between selected demographic variables with level of pain during immunization among infants in control group.

H_3 : There will be a significant association between selected demographic variables with level of pain during immunization among infants in experimental group.

Conceptual frame work : Ernestine Weidenbach's prescriptive theory

Research design : True experimental post test only design

R E X O1

R C O2

Population : Infants in the age group of 1-4months who came for immunization.

Sampling technique : Probability simple random sampling by lottery method.

Samples : Infants (1-4months) who were attending Child Health Clinic, Trichy for immunization

Sample size : 60 samples.

Setting : Child Health Clinic, Trichy

Tool	:	Neonatal Infant pain scale (NIPS)
Data collection	:	A true experimental post test only design was used. The data was collected from mothers of infants who were attending the Child Health Clinic, Trichy for immunization. The period of data collection was from 27.07.2015 to 29.08.2015 between 10.00am to 4.00pm. The researcher first met the mothers of infants, rapport was developed and the researcher obtained oral consent from all participants. In control group, the pain level during immunization was measured without intervention. The intervention (oral glucose solution) was provided to experimental group. Then the pain level during immunization was measured by using Neonatal-Infant Pain Scale (NIPS).
Data analysis	:	Descriptive statistics (Frequency, percentage, mean and standard deviation) and inferential statistics (independent t-test and chi square) were used to test the research hypothesis.

MAJOR FINDINGS OF THE STUDY

1. The results of this study showed that infants in control group had moderate and severe level of pain during immunization.
2. The results of this study showed that infants in experimental group had only mild and moderate level of pain during immunization.
3. The finding showed that there was a significant decrease on level of pain among infants in experimental group as compared to the control group.
4. There was no association between selected demographic variables with the level of pain in control group.
5. There was a significant association between selected demographic variable, age of the infant with level of pain in experimental group.

CONCLUSION

The study brought out the following conclusions that Oral glucose administration improves the emotional security and reduces the pain perception in infants and this is a safe, non invasive, inexpensive, and independent nursing function.

CHAPTER I

INTRODUCTION

BACKGROUND OF THE STUDY

Childhood is the period of rapid growth and development. At no other time in life are physical changes and developmental achievements so dramatic as during infancy. In the early months baby's sense sharpens and, with the process of attachment to primary caregivers, they form their first social relationships. Because of these rapid changes first year of life becomes a very crucial one.

An infant is the word derived from a Latin word 'in fans' which means unable to speak or speechless very young offspring of a human.

Park,K. (2014) coded that one of the most dramatic advances in paediatrics has been the decline of infectious diseases during the twentieth century because of the wide spread use of immunization for preventable diseases. Immunization is the right of every child. Immunizations are the safest and most effective way to prevent serious illness and death. In fact, Immunization prevents approximately 2.5 million deaths every year. However, despite the success of immunization in preventing morbidity and mortality, some countries struggle to maintain high levels of immunization uptake.

Eden,L.M., Macintosh,J.L.B., Luthy,K. and Beckstrand,R.L. (2014) stated that the Centres for Disease Control and Prevention recommended immunization to prevent 17 life-threatening diseases. Consequently, adherence to the recommended immunization schedule means children will receive an average of 18–24 injections by the time they are 2 years old. Notwithstanding the protection immunization provide against so many diseases, some parents delay or refuse childhood immunization for a variety of reasons. A few of the

common parental reasons for refusing childhood immunization include questioning immunization safety, distrust of the government, concern about contraindications with a child's underlying medical condition, as well as the pain and anxiety associated with needle puncture.

Taddio,A. et al. (2015) coded that immunization are the most common painful and anxiety producing procedures to take place in the outpatient health care clinic, although health care providers usually consider immunization to be a benign procedure requiring little intervention. Unfortunately, two out of every three adults with needle phobia are less likely to immunize their own children. Despite the fact that needle-associated pain during immunization is a surmountable barrier, it is still a main reason for noncompliance to the immunization schedule. Thus, health care professionals should be aware of these issues and employ techniques to reduce anxiety and pain during immunization, an act that may promote adherence to the immunization schedule. Preparation of the child before the procedure seems to reduce anxiety and subsequent pain.

Hockenberry,M.J., Wilson,D. and Winkilstein,M.L. (2005) stated that pain is an unpleasant feeling that is conveyed to the brain by nerves in the body. Pain arises from any number of situations. Pain is experienced by all age groups, both sexes, and all races and ethnic groups. Pain is the most common symptom of injury and disease. Descriptions can range in intensity from a mere ache to unbearable agony. It may accompany a psychological condition such as depression or may even occur in the absence of a recognizable trigger. Perception gives information on the pain's location, intensity and something about its nature. Receptors have the ability to convey information to the brain that indicates the location, nature and intensity of the pain. Pain perception also varies depending on the location of the pain.

International Journal of Paediatrics (2010) stated that pain is one of the most frequent complaints presented in paediatric emergency settings. Thus it is important for health care providers to follow a child centred or individual approach in their assessment and management of pain and painful procedures. The child and family should be the active participants in the procedure. In fact, allowing parents or family members to act as positive assistants rather than negative restraints helps to reduce stress in both children and parents and minimizes the pain experiences.

Some painful, invasive procedures are necessary for care and are commonly performed in both healthy and sick neonates. Current evidence shows that the newborn infant has both physiologic and anatomic capacity to experience pain. Recent research suggests that pain experienced in the neonatal period might have long term effects later in life.

Marlow,D.R. and Redding,B.A. (2013) coded that pain is a subjective experience and children respond to pain with behavioural reactions that depend upon their age and cognitive processes. Behavioural cues are the primary sources of data and these include increased irritability, restlessness, lack of appetite, pulling away, increase in heart rate and respiration often present with pain.

Carbajal,R., Chauvet,X., Couderc,S. and Olivier-Martin,M. (2011) insisted that the pain evaluation in newborns remains difficult. Health professional must have faith in reactions such as behavioral changes and physical variables or the presence of stress hormones that interfere with the pain. For the assessment of pain in children there are some unique tools available to measure pain intensity in children such as Oucher scale, FACES scale, Face, Leg, Activity, Cry and Consol ability (FLACC) scale, Newborn Infant Pain Scale, Toddler-Preschooler Pain Scale(TPPS).

Melzack and Wall. (1965) in Gate Control theory explains about a pain modulating system in which a neural gate present in the spinal cord can open

and close thereby modulating the perception of pain by the substantia gelatinosa, dorsal column fibers and central transmission cells and suggested that psychological factors play a role in the perception of pain. Gate is opened by physical, emotional and behavioural factors .Gate may be closed by physical pain (analgesic remedies), emotional pain (being in a good mood) and behavioural pain (complementary therapy).

Kyle, T., (2009) stated that various techniques may be available to assist in managing mild pain in children or augment the effectiveness of medications for moderate or severe pain. Many of these non pharmacologic techniques assist children in coping with pain and give them an opportunity to feel a sense of mastery or control over the situation. In these techniques, the parents need to be involved.

Complementary and alternative therapy is a group of diverse medical and health care system, practices and products that are generally considered a part of conventional medicine. Benefits of complementary therapy can help to restore the body's natural equilibrium and balance. When the body is relaxed and in balance it can cope up with the everyday stresses and strains of life much more effectively, boost the immune system, help eliminate toxins, help relieve pain, improve circulation, improve sleep pattern, increase energy levels, induce deep relaxation, reduces stress and tension, restore balance of body systems and target specific physical mental, emotional or spiritual problems.

Taddio, A. et al (2012) in the CDC has adapted injection pain management guidelines which consist of psychological intervention, topical anaesthetics, breastfeeding, sucrose solution and modification of immunisation procedures.

Brunt,A. (2012) enumerated how to give oral glucose to the infants and how to prepare it and the total amount of it to be given orally, using an oral medication syringe. Give approximately one quarter of the total amount of sucrose 2 minutes prior to the start of the procedure. Incrementally give the rest

of the glucose throughout the procedure, as needed. The analgesic effect lasts 5-8 minutes from first administration. Follow recommended amount and consult patient's medical treating team if additional dosing is required. Sucrose is not appropriate for the management of continuing pain or distress.

Glasziou,P. et al. (2013) coded that a sweet solution, such as sucrose or glucose, can be used for analgesia for minor short term procedural pain, such as immunisation, in infants up to 12 months of age. The sweet solution is given orally and provides short term analgesia. It has National Health and Medical Research Council (NHMRC) Level I evidence of efficacy and no serious adverse effects have been reported.

Gradin,M., Finnstrom,O. and Schollin,J. (2004) enumerated the effect of oral administration of sweet solutions has been often investigated and proved to be an effective alternative. Sweet food has been used to comfort children throughout history. The use of orally administered sweeteners for painful procedures is known worldwide and is recommended by national and international guidelines. The sweet solution puts two mechanisms into action: first, a tactile stimulation of fluid in the mouth provides an initial effect and, second, the sense of taste stimulation prolongs the effect through the release of those endogenous opiates.

Deshmukh,L.S. and Udani,R.H. (2012) stated that sucrose and glucose are the most common sweet solutions used and are effective, easy to use and safe. The effect of sweet solutions on pain cannot be fully explained, but activation of the endogenous opiates is often described as a potentially responsible process.

NEED FOR THE STUDY

Pain management is a major aspect of nursing care. As a care giver for children, nurses are obliged to minimize the emotional and physical effects of painful procedures. The cardinal responsibility of the paediatric nurse is to ease pain and to provide comfort to children. Nurses are in a unique position to improve the management of pain because children and parents often express their feelings to nurses than to physicians.

Psychological safety is one of the essential needs of all the human needs. Pain due to painful procedures places an enormous burden on children. Inadequate pain management could lead to an increase in child's discomfort, stress and decreased coping abilities

Parents and health care professionals have a joint responsibility for immunizing the children. The pain associated with immunization is a source of anxiety and distress for the children receiving the immunization, their parents, and the providers who must administer them.

Taylor,R.C. and Lillis,C. (2010) stated some Bills of Rights for people with pain that is (1) The Right to have my reports of pain accepted and acted by health care professionals. (2) The Right to be treated with respect at all the times.

The initial insertion of the needle may be uncomfortable to some and may not be so to others. Experience with pain may vary and could be a result of many factors such as sensitive skin and personal level of pain tolerance.

Potana,N. et al. (2015) stated that inadequately managed pain have multiple adverse effects. Pharmacological agents, due to their side-effects are usually reserved for severe pain. These factors possibly prevent health care providers from addressing procedural pain.

The majority of health care professionals recognize that there is a lack of intervention to decrease the unpleasantness of procedural pain. Unnecessary pain can also erode the therapeutic relationship with the child. The knowledge of alternative techniques in pain management can improve patient care and satisfaction.

Grunau and Graig (1987) enumerated that treating pain has become a crucial part in healthy neonates and infants. The most common painful procedures are immunization and venipuncture. Pharmacological treatment rarely used to determine these procedures, concerned about their effectiveness and potential adverse effect. Therefore non-pharmacological interventions are valuable alternatives. Health care providers are constantly on the lookout for a safe and effective pharmacological or non-pharmacological method to alleviate pain in neonates and infants.

Deodari,A. (2013) coded that children are known to have adverse short and long-term effects of prolonged or repeated unmanaged pain which increases the response elicited by future painful stimuli and even by usually non-painful stimuli. The consequences also include altered pain sensitivity and permanent neuro-anatomical, behavioural, emotional and learning disabilities.

Thyr,M., Sundholm,A., Teeland,L. And Rahm,V.A.(2007)emphasized that oral glucose is an analgesic to reduce infant distress following immunization at the age of 3, 5 and 12 months. A prospective controlled trial of 110 infants was randomized to receive 2 ml of 30% glucose or water. And found that administration of glucose reduced the mean crying time by 22% at 3months, 62% at 5 months and 52% at 12 months. Sweet solution can be used as a simple and safe method to reduce the distress following immunization in infants up to 12 months.

Harrison, D. et al. (2010) conducted a study to assess the use of oral sucrose which has been the most extensively studied pain intervention in newborn care to date. The aim of this article is to review what is known about

the mechanisms of sucrose-induced analgesia, highlight existing evidence and knowledge gaps, current controversies and provide directions for future research and practice. More than 150 published studies relating to sweet-taste-induced calming and analgesia in human infants have been identified. Sucrose has been widely recommended for routine use during painful procedures in newborn and young infants.

The investigator during her clinical experience has found the distress and discomfort shown by the babies during immunization. While the researcher was searching for the best method for pain reduction during immunization the investigator found that oral glucose administration was one of the methods that reduce pain perception in neonates and infants during immunization. This motivated the investigator to take up this study. The purpose of this study was to assess the effectiveness of oral glucose solution on level of pain during immunization among infants.

STATEMENT OF THE PROBLEM

A true experimental study to assess the effectiveness of oral glucose on pain during immunization among infants at Child Health Clinic, Trichy, 2015-2016.

OBJECTIVES OF THE STUDY

1. To assess the level of pain during immunization among infants in control group.
2. To evaluate the effectiveness of oral glucose administration on level of pain during immunization among infants in experimental group.
3. To compare the level of pain during immunization among infants in control group and experimental group.
4. To determine the association between selected demographic variables with level of pain during immunization among infants in control group.
5. To determine the association between selected demographic variables with level of pain during immunization among infants in experimental group.

HYPOTHESIS

H_1 : There will be a significant difference on level of pain during immunization among infants in experimental group as compared to control group.

H_2 : There will be a significant association between selected demographic variables with level of pain during immunization among infants in control group.

H_3 : There will be a significant association between selected demographic variables with level of pain during immunization among infants in experimental group.

OPERATIONAL DEFINITION

EFFECTIVENESS

It is defined as a result produced by agents, actions or force.

In this study, it refers to the action of oral glucose in reduction of the level of pain during immunization among infants (1-4months) as measured by Neonatal Infant Pain Scale (NIPS).

ORAL GLUCOSE

It refers to the administration of glucose solution orally for fluid or nutrient replacement.

In this study it refers to the oral administration of 2milliliters of 25% dextrose solution 3-5minutes prior to immunization.

PAIN

Pain is a feeling of distress, suffering or agony caused by stimulation of specialized nerve endings.

In this study, it refers to the feeling of discomfort like cry, changes in facial expressions during immunization which was measured by Neonatal Infant Pain Scale (NIPS).

IMMUNIZATION

It is one of the most important tools for protecting individuals and the community from serious infectious diseases

In this study it refers to infants receiving prophylaxis (pentavac, quadrovax) against infection.

INFANTS

It is applied to the babies belonging to the age group of 0-12months.

In this present study it refers to the babies belonging to the age group of 1-4 months of age who were receiving immunization.

ASSUMPTION

1) Oral glucose administration may reduce pain among infants during immunization.
2) Nurses have a role to play in reduction of pain in infants during immunization.

DELIMITATION

This study was delimited to

1) 6 weeks only.
2) 60 samples only.
3) Infants (1-4months) who came for immunization only.
4) The assessment of level of pain was done only with Neonatal Infant Pain Scale (NIPS).

CHAPTER II

REVIEW OF LITERATURE

INTRODUCTION

The present chapter discusses the studies linked with pain and the effect of oral glucose on the level of pain. The case studies presented on the following paragraphs are found to be an evidence of how oral glucose is used as a pain reducing tool during immunization.

The investigator carried out an extensive review on literatures on the research topic in order to collect maximum relevant information. The aim of this systematic review is to summaries the best available information. The most current information helps in providing adequate knowledge and better practices regarding management of pain and effectiveness of oral glucose on pain reduction. For building the review of literature it has been divided under the following headings

A) Literature related to pain during minor invasive procedures.

B) Literature related to effectiveness of oral glucose on pain reduction.

LITERATURE RELATED TO PAIN DURING MINOR INVASIVE PROCEDURES

Taddio,A. et al. (2015) conducted a study to determine the impact of educating parents about pain in outpatient pediatric clinics on their use of pain treatments during routine infant vaccinations. Parents of 2 to 4month old infants attending the intervention clinics reviewed a pamphlet and a video about vaccination and pain management on the day of vaccination. Altogether, 160 parent-infant participated on the education day and at follow-up vaccinations. Use of pain interventions during vaccinations was higher in the intervention group. This study concluded that educating parents about pain

management in a hospital outpatient setting leads to higher use of pain interventions during routine infant vaccinations.

Shah,V. et al. (2015) conducted a study to assess the effect of pharmacological and combined interventions to reduce vaccine injection pain in children. An electronic database was searched for relevant randomized and quasi-randomized controlled trials. Self-reported pain and fear as well as observer-rated distress were critically important outcomes. This study concluded that breastfeeding, topical anaesthetics, sweet-tasting solutions and the combination of topical anaesthetics and breastfeeding are effective in reducing vaccine injection pain in infants and children and its use should become the standard of care.

Kavitha,S. (2015) conducted a true experimental study to evaluate the effect of music therapy on pain during intravenous infusion among 60 hospitalized toddlers (2-3 years) by simple random sampling method. The tool used was (FLACC) pain rating scale. There was no association between selected demographic variables with post test level of pain scores in control group and in experimental group, it was concluded that music therapy provides coping strategies that may help to reduce pain perception, make pain more tolerable, decrease anxiety, and enhance the effectiveness of analgesics.

Moghadam,B.M., Kianmehr,M., Noghabi,P.S. and Moghadam,B.K. (2014) conducted a study to assess the effect of eutectic mixture of local anaesthetics cream and rattle on soothing the vaccination pain on four-month-infants. The single blind randomised clinical trial of 50 subjects of four-month infants who were selected randomly and divided into three groups. The study concluded that eutectic mixture of local anaesthetics cream and shaking rattle were effective in attenuating pain of vaccination among the infants, but the latter was not as significant as the former.

Nanthini. (2014) conducted a study to assess the effectiveness of facilitated tucking by parents on level of pain during immunization among 60

infants by using probability simple random sampling method. The pain during immunization was assessed by using Neonatal Infant Pain Scale. Experimental group had experienced mild and moderate pain during immunization when compared to control group. The result concluded that there was significant decrease on level of pain in experimental group as compared to control group and there was no association between selected demographic variables with the level of pain during immunization.

Lisi,D., Campbell,L., Riddell,P.R., Garfield,H. and Greenberg,S. (2013) conducted a study to find out the naturalistic parental pain management during immunizations during the first year of life. Among 760 parent-infant dyads were recruited from 3 paediatric clinics in Toronto. Across all age groups, physical comfort, rocking, and verbal reassurance were the most commonly used non pharmacological pain management techniques. Pacifying and distraction appeared to be most promising in reducing needle-related distress in our sample of healthy infants. Parents in this sample seldom used pharmacological pain management techniques.

Codipietro,L., Bailo,E., Nangeroni,M., Ponzone,A. and Grazia,G. (2011) conducted a study to evaluate the current practice regarding pain assessment and pain management strategies adopted in commonly performed minor painful procedures in 35 NICUs. This study found the underuse of neonatal pain scales (33), sucrose solution administration before heel lance (23.3), topical anesthetics before venipuncture, or other analgesic techniques.

LITERATURE RELATED TO EFFECTIVENESS OF ORAL GLUCOSE ON PAIN REDUCTION

Sajedi,F., Kashaninia,Z., Rahgozar,M. and Radrazm,L. (2015) conducted a study to find out the efficacy of oral glucose for relieving pain following intramuscular injection in 64 term neonates during 1 month. The primary outcome measure was the cumulative Neonatal Infant Pain Scale (NIPS) score at 3 minutes after injection. Oral 30% glucose given 2 minutes

before injection was effective in reducing neonatal pain following injection. It is a simple, safe and fast acting analgesic and should be considered for minor invasive procedures in term neonates.

Gray,L., Garza,E., Zageris,D., Heilman,K.J. and Porges,S.W. (2015) conducted a study to examine the analgesic effect of sucrose combined with radiant warmth compared with the taste of sucrose alone during a painful procedure in healthy full-term newborns. A randomized, controlled trial included 29 healthy, full-term newborns. Both groups of infants were given 1.0milliliters of 25% sucrose solution 2 minutes before the vaccination, and 1 group additionally was given radiant warmth from an infant warmer before the vaccination. The pain level was known in comparing differences in cry, grimace, heart rate variability, and it was concluded that the combination of sucrose and radiant warmth is an effective analgesic in newborns and reduces pain better than sucrose alone.

Uzelli,D. and Günes,Y. (2015) conducted a prospective, randomized trial to investigate the effect of glucose solution on the pain of intramuscular injection in 80 preterm infants. The results suggest that oral glucose, even if used in the lowest dose, may have a pain-relieving effect in preterm infants if administered pre-procedure.

Suhrabi,Z., Taghinejad,H., Valian,K., Sayehmiri,K. and Taheri,S. (2014) conducted a comparative study on the efficacy of glucose and sucrose on the vaccination pain on 90 neonates who were vaccinated against Hepatitis B. Who were assigned to Glucose, Sucrose and control groups. Patients who received Glucose or Sucrose had lower pain intensity in comparison with the others.

Messerer,B., Krauss-Stoisser,B. and Urlesberger,B. (2014) describes simple but painful procedures in premature infants, neonates and infants, pain can be effectively reduced by the oral administration of glucose. The positive effect is guaranteed particularly for the use in a once only pain stimulation. Non-nutritive sucking, swaddling, facilitated tucking and kangaroo mother

care, for example can be used as supportive measures during slightly painful procedures

Ravishankar,A. et al. (2014) conducted a study to determine if oral dextrose solution can mitigate the pain response to nasogastric tube (NGT) insertion in neonates. One hundred and fifty consecutive neonates were randomised into three groups to receive 25% dextrose (D25), or 10% dextrose (D10) or placebo (distilled water). An NGT was inserted after giving 2milliliters of one of the solutions orally. Total PIPP score, duration of cry, change in heart rate and oxygen saturation (SpO2) were compared among the three groups. A result was Oral D25 was effective in reducing the pain response during NGT insertion in neonates when compared with oral D10 and placebo.

Stevens,B., Yamada,J., Lee,G.Y. and Ohlsson,A. (2013) conducted a study on the effect of Sucrose for analgesia in newborn infants undergoing painful procedures. The conclusion was that sucrose is safe and effective for reducing procedural pain from single events. Further investigation on repeated administration of sucrose in neonates and the use of sucrose in combination with other non-pharmacological and pharmacological interventions is needed.

Sahoo,J.P., Rao,S., Nesargi,S., Ranjit,T., Ashok,C. and Bhat,S. (2013) conducted a study to compare the effect of expressed breast milk (EBM), 25% dextrose (25D) and sterile water (SW) on procedural pain in neonates as assessed by the premature infant pain profile (PIPP), changes in heart rate (HR), oxygen saturation (SpO2) and duration of crying. 210 babies who required venipuncture for blood sampling and who were on oral feeds were recruited into the study after parental informed consent. The enrolled babies were randomized into intervention groups 2 minutes before venipuncture. The face and crying of baby were video graphed by an independent, blinded observer. EBM significantly reduces procedural pain in neonates though to alesser extent as compared to 25% dextrose.

Goswami,G., Upadhyay,A., Gupta,N.K., Chaudhry,R., Chawla,D. and Sreenivas,V. (2013) has conducted a study to compare analgesic effect of direct breast feeding, 25% dextrose solution and placebo as they give 1st intramuscular whole cell DPT injection to 6week - 3month old infants. The participants are randomized in to three groups of 40 each. And was found out that direct breastfeeding and 25% dextrose act as analgesic in young infants undergoing DPT vaccination less than 3 month of age.

McCall,J.M., DeCristofaro,C. and Elliott,L. (2013) conducted a data based study to provide information regarding the effective use of oral sucrose as an analgesic for immunization and venipuncture procedures in the older infant. Data's were collected from evidence-based literature including original clinical trials,reviews, and clinical practice guidelines. This study concluded that oral sucrose solution in a 24% concentration at a dose of 2 milliliters approximately 2 minutes prior to the painful procedure has been shown effective in reducing pain during immunizations and venipuncture in the outpatient setting in infants aged 1-12 months old.

Leng,H.Y., Zheng,X.L., Yan,L., Zhang,X.H., He,H.Y. and Xiang M. (2013) conducted a study to compare the effect of different types and concentrations of sweet solutions on neonatal pain during heel lance procedure on 560 full term neonates were randomized into 7groups: placebo group (plain water), 10% glucose, 25% glucose, 50% glucose,12% sucrose, 24% sucrose and 30% sucrose groups. Conclusion was that oral administration of sweet solutions is an effective way to relieve neonatal pain on procedure, and sucrose has a better pain relief action than glucose, moreover, 30% sucrose provides better effect in control of pain.

Chattopadhyay,D., Kundu,P., Gunri,S. and Bisoi,S. (2011) conducted a study to find out the effect of oral sucrose on pain during DPT immunization in older infants and found that oral sucrose solution is thus recommended as a feasible means of minimizing pain of vaccination by injection.

Kassab,M., Sheehy,A., King,M., Fowler,C. and Foureur,M. (2011) conducted a double-blind randomised controlled trial to determine the effectiveness of 25% oral glucose solution in reducing immunisation pain in 2-month old infants. A total of 120 healthy full-term infants who were attending immunisation clinics for routine 2-month immunisation were randomised to receive either 2milliliters of 25% oral glucose solution immediately prior to their immunisation or 2 milliliters of oral sterile water.. Primary outcome was behavioural pain measured using the Modified Behavioural Pain Scale (MBPS). The study concluded that a 2 ml oral dose of 25% glucose given immediately before an immunisation procedure reduces pain in 2-month old infants.

Alves,C.O., Duarte,E.D., Azevedo,V.M., Nascimento,G.R. and Tavares,T.S. (2011) aimed to evaluate the evidence of the effect of oral sucrose or glucose for acute pain relief in premature infants. An integrative review was conducted in the MEDLINE and LILACS databases. Eight articles were selected from 2005 to 2010. The analysis of these articles revealed the analgesic effect of glucose and sucrose in acute procedures. No significant side effects were found in infants who received glucose or sucrose. The study emphasized the importance of the use of the pain assessment scale most closely related to the predominant population in the Neonatal Intensive Care Unit, a scale easy to be used and handled by health professionals.

Ramya,S. (2011) conducted a experimental study to assess the effectiveness of oral sucrose in reduction of pain in infants during venipuncture . The study was carried out on a sample size of 60 which was selected by a simple random sampling technique 30 of experimental and 30 of control group. The study concluded that oral sucrose was effective in managing pain during venipuncture.

Dilen,B. and Elseviers,M. (2010) conducted a study on Oral glucose solution as pain relief in newborns using double-blind clinical trial of 304

newborns was conducted on a maternity and neonatal ward. During at least 1 month, one of the four selected solutions (10, 20, 30% glucose, and placebo) was administered orally, 2 minutes before the venipuncture was performed. The pain from the skin puncture was scored using a validated pain scale (the "Leuven Pain Scale"). And the study concluded that oral administration of 2 milliliters of 30 percent glucose 2 minutes before the venipuncture provides the most effective pain reduction in newborns.

Barclay,L. (2010) conducted a study to determine the effectiveness of oral sweet solutions versus water or no treatment to relieve pain in infants aged 1 to 12 months who were undergoing immunization. Internet searches and manual searches of bibliographies from retrieved articles and the study authors conclude. "This information is important for healthcare professionals working with infants in both inpatient and outpatient settings, as sweet solutions are readily available, have a very short onset of time to analgesia, are inexpensive and are easy to administer. The study concluded that infants those who received oral sweet solution had less pain and those who does not received intervention had highest level of pain.

CONCLUSION

The above research studies justify the need and importance of the present study on administration of oral glucose during immunization. Eliminating the need for sedation in pediatric patients receiving non-invasive procedures is not only a cost effective measure for healthcare organizations but also greatly benefits patients and family members by increasing child's safety and decreasing the child's, family members and nurse's anxiety. Thus, the researcher concluded that the oral glucose administration during painful procedure is an effective method that can be followed in every setting.

CONCEPTUAL FRAME WORK

The conceptual frame work provides a conceptual perspective regarding the inter-relating phenomenon. It deals with abstractions (concepts) that are assembled by virtue of their relevance to a common theme. Conceptual models are useful in research process in clarifying concepts and their associations, in enabling researchers to place a specific problem into appropriate context. This study was based on the concept that oral glucose solution reduces the level of pain during immunization among infants. The researcher adopted Ernestine Weidenbach's prescriptive theory (1969) as the foundation for developing conceptual frame work.

Weidenbach's theory is made up of three factors as follows:

The central purpose

Prescription

Realities

CENTRAL PURPOSE

The nurse's central purpose is the quality of health. She desires to be effective and recognizes her special responsibility in caring for the child. In this study the central purpose is to assess the effectiveness of oral glucose solution on level of pain during immunization among infants.

PRESCRIPTION

Once the nurse identifies needs of the child, she develops a prescription or plan of care. In this study, the researcher planned to provide oral glucose for experimental group.

REALITIES

The realities are

Agents

Recipient

Goal

Means

Framework

The conceptual framework of this nursing theory consists of the following steps:

Identification of the patients need for help.

Ministration of the help needed.

Validation that the action taken was helpful to patient.

IDENTIFICATION

The nurse identifies the patients' needs. In this study the need was to decrease the level of pain in infants

MINISTRATION

Ministering to the patient, the nurses apply a comfort measure or therapeutic procedure.

Ministration had two components

Prescription

Realities

Prescription

The nurse provides care to the patient. Oral glucose solution was given for infants in experimental group and was not given to control group. The procedure 2 millilitres of oral glucose solution was administered orally 2 minute prior to immunization by a syringe whereas; control group did not receive glucose solution during immunization.

Realities

Agent: It refers to the nurse who practices the procedure. In this study the researcher is the agent.

Recipient: The patients are the recipient of nurse's action. In this study infants were the recipients.

Goal: The goal is the desired outcome the nurse wishes to achieve. In this study the goal is to reduce the level of pain in infants.

Means: Oral glucose administration through syringe.

Framework: Framework consists of human, environment, professional and organization. In this study the framework is a child health clinic.

VALIDATION

After ministering the help, the nurse validates that the action were indeed helpful. Here the researcher validates the level of pain by Neonatal Infant Pain Scale (NIPS) both in experimental and control group. The experimental group had reduced crying, relaxed movements, restful facial expressions after administration of oral glucose solution. The control group had vigorous cry, tensed muscle, stiff joints and tight facial muscles.

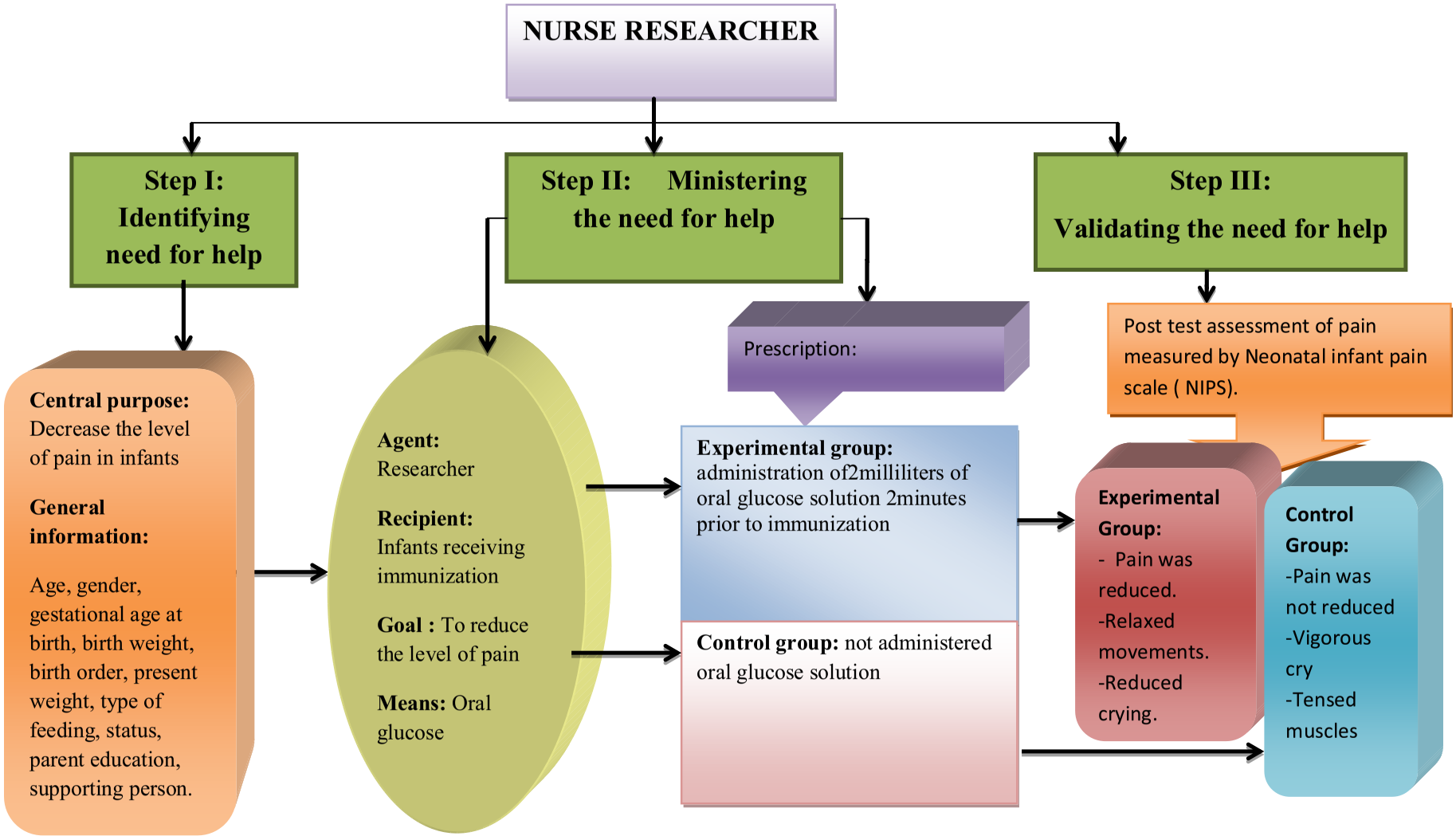

FIGURE 1: MODIFIED ERNESTINE WEIDENBACH'S PRESCRIPTIVE THEORY

CHAPTER III

RESEARCH METHODOLOGY

INTRODUCTION

Methodology of research refers to the investigation of the ways of obtaining, organizing and analyzing data. Methodology studies address the development, validation and evaluation of research tools or methods.

-Polit and Beck (2008)

The research methodology includes the research design, setting of the study, population, sampling technique, criteria for sample selection, sample size, research tools and technique, validity of the tool, reliability of the tool, scoring procedure, pilot study, data collection procedure, plan for data analysis and protection of human subjects.

RESEARCH APPROACH

A Quantitative evaluative approach was used for this study.

RESEARCH DESIGN

The research design selected for this study is true experimental post-test only research design.

R E X O1

R C O2

R- Randomization

E- Experimental group

C – Control group

X- Treatment

O1- Level of pain in experimental group

O2 - Level of pain in control group

SETTING OF THE STUDY

The study was conducted in a child health clinic which was situated 5kilometers from Dr G Sakunthala College of Nursing, Trichy. Daily 80-100 children was attending Pediatric OPD. Immunization was given in all the weekdays. About 10-15 babies are attending the clinic for immunization. The reason for selecting this clinic is availability of sample and facility for the study.

POPULATION

In this present study, the population was focused on infants (1-4months), who came for immunization.

SAMPLE

The sample consisted of infants (1-4months) who were attending Child Health Clinic, Trichy for immunization.

SAMPLE SIZE

Sample size consisted of 60 infants (30-control group and 30 -experimental group).

SAMPLING TECHNIQUE

The sampling technique used was Probability Simple Random Sampling by lottery method.

CRITERIA FOR SAMPLE SELECTION

INCLUSION CRITERIA

1. Infant with 1-4 months of age
2. Infants of both sexes.
3. Infants who were available at the time of data collection.
4. Infants who are coming for pentavac, quadrovax immunization

EXCLUSION CRITERIA

1. Infants with current medical illness and developmental delay
2. Infants who were above 4 months of age

RESEARCH TOOL AND TECHNIQUE

In this research study, the observational check list of "Neonatal Infant Pain Scale (NIPS)" was used.

DESCRIPTION OF THE TOOL

Instrument consisted of 2 sections.

Section I – It consisted of selected demographic variables.

Section II –Neonatal Infant Pain Scale (NIPS)

SCORING PROCEDURE

Neonatal Infant Pain Scale

Range: 0-7

No pain: 0-2

Mild pain: 3-4

Moderate pain: 5-6

Severe pain: >6

TESTING OF INSTRUMENTS

VALIDITY

The tool was evaluated by 5 experts who were requested to give their valuable suggestions about the content area, relevance, clarity and appropriate need of items.

RELIABILITY

The reliability of the tool was established by assessing the quality and adequacy of the tool using inter-rater reliability method. The “r” value was 0.8 and hence the tool was reliable.

PILOT STUDY

After obtaining formal administrative approval, the pilot study was carried out with 10 infants (5-experimental group and 5- control group), who were undergoing immunization, at Child Health Clinic, Trichy during 6.07.15 to 11.07.2015. The intervention (oral glucose solution) was given to the experimental group, and then the pain score was assessed during immunization by two observers for each sample. In control group, without giving any intervention the pain score was assessed during immunization by two observers for each sample. The data collection was amenable to statistical analysis and thus the study was found to be feasible. The pilot study samples were excluded in the main study.

DATA COLLECTION PROCEDURE

The period of data collection was from 27.07.2015 to 29.08.2015. Before starting the study, the investigator obtained formal permission from the Principal, Head of the Pediatrics Department and Research Committee Members of Dr. G. Sakunthala College of Nursing. Prior to data collection the investigator obtained formal permission from the Doctor in charge of the clinic

to conduct the study. 60 samples (30-control group, 30-experimental group) were selected with probability simple random sampling by lottery method. A true experimental post test only research design was used. The data was collected from mothers of infants (1-4months) who were attending the outpatient department for immunization. The timing of data collection was from 10.00am to 4.00pm. The researcher identifies the samples depending on the availability and basis on the inclusion criteria. The researcher first met the mothers of infants, rapport was developed and the researcher obtained oral consent from all participants. The nature and purpose of the study was explained to the mothers.The intervention (oral glucose solution) was provided to the infants in the experimental group and the level of pain during immunization was measured by using Neonatal Infant Pain Scale (NIPS). In control group, the pain level was assessed without intervention. Oral glucose solution reduced the level of pain among infants 1-4 months of age during immunization.

PLAN FOR DATA ANALYSIS

The collected data was arranged and tabulated to represent the finding of the study. Both descriptive and inferential statistics was used. All the analysis was done by SPSS 20thversion.

Frequency and percentage distribution was used to analyze demographic variables. Percentage, mean, standard deviation and independent t-test was used to compare the level of pain in control and experimental group. Chi-square test was used to determine the association between selected demographic variables with the level of pain in control group and experimental group.

ETHICAL CONSIDERATION

The research proposal was approved by the ethical committee of the institution prior to pilot study. Permission was obtained from the Doctor in-Charge of the clinic. Oral consent was obtained from each participant of study before starting data collection. The purpose of the study was explained and assurance was given to the subject that confidentiality of each individual would be maintained. The mothers were informed that they are free to withdraw from study at any time.

CHAPTER IV

ANALYSIS AND INTERPRETATION OF DATA

This chapter deals with the description of the sample, analysis and interpretation of data to assess the effectiveness of oral glucose on pain during immunization among infants. The obtained data have been classified, grouped and analyzed using descriptive and inferential statistics based on the objectives of the study.

OBJECTIVES

1. To assess the level of pain during immunization among infants in control group.
2. To evaluate the effectiveness of oral glucose administration on level of pain during immunization among infants in experimental group.
3. To compare the level of pain during immunization among infants in control group and experimental group.
4. To determine the association between selected demographic variables with level of pain during immunization among infants in control group.
5. To determine the association between selected demographic variables with level of pain during immunization among infants in experimental group.

ORGANIZATION OF FINDINGS

The analysis of data has been organized and presented under the following headings.

SECTION I : Frequency and percentage distribution of samples according to demographic variables.

SECTION II : Percentage distribution of level of pain during immunization among infants in control group and experimental group.

SECTION III : Comparison of mean scores between control group and experimental group

SECTION IV : Association between selected demographic variables with level of pain in control group

SECTION V : Association between selected demographic variables with level of pain in experimental group.

SECTION I

This section deals with demographic variables of the samples

Table-1

Frequency and percentage distribution of samples according to demographic variables. (N= 60)

S. No	Demographic Variables	Control Group (n=30)		Experimental Group (n=30)	
		Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
1.	Age				
	a. $1^{1/2}$ months	10	33.3	9	30.0
	b.2 $^{1/2}$months	10	33.3	7	23.3
	c.3 $^{1/2}$months	10	33.3	14	46.7
2.	Gender				
	a.Male	12	40.0	16	53.3
	b.Female	18	60.0	14	46.7
3.	Gestational Age At Birth				
	a.<37weeks	3	10.0	3	10.0
	b.>37weeks	27	90.0	27	90.0
4.	Birth Weight				
	a.<2.5 kilograms	0	0	0	0
	b.>2.5 kilograms	30	100.0	30	100.0
5.	Birth Order				
	a.1st child	13	43.3	10	33.3
	b.2nd child	15	50.0	17	56.7
	c.3 rd and above	2	6.7	3	10.0

6.	Present Weight				
	a. Normal	28	93.3	28	93.3
	b. Underweight	1	3.3	1	3.3
	c. Overweight	1	3.3	1	3.3
7.	Type Of Feeding				
	a.Breast Feeding	14	46.7	14	46.7
	b.Formula Feeding	8	26.7	5	16.7
	c.Both	8	26.7	11	36.7
8.	Status of the Baby				
	a.Awake	27	90.0	28	93.3
	b.Sleeping	3	10.0	2	6.7
9.	Parent Education				
	a.Illiterate	4	13.3	6	20.0
	b.Higher Secondary	13	43.3	9	30.0
	c.Degree	13	43.3	15	50.0
10.	Supporting Person				
	a.Mother	25	83.3	27	90.0
	b.Father	3	10.0	2	6.7
	c.Others	2	6.7	1	3.3

Table-1, shows the frequency and percentage distribution of the demographic variables. In that equal number of the infants, 10 (33.3%) was there in each age group in control group and 14 (46.7%) in experimental group belong to age of 31/2 months.

Most of the infants, 18 (60%) in control group were female and 16 (53.3%) in experimental group were male.

Equal number of infants, 27 (90%) in control group and experimental group were more than 37weeks of gestation at birth.

All the infants, 30 (100%) in control group and experimental group were more than 2.5kilograms at birth.

Almost equal number of infants, 15 (50%) in control group and 17 (56.7%) in experimental group were 2nd child to their parents.

Equal number of infants, 28 (93.3%) in control group and experimental group was having normal weight.

Equal number of infants, 14 (46.7%) in control group and experimental group were on breast feeding.

All most equal number of infants, 27 (90%) in control group and 28 (93.3%) in experimental group were awake during immunization.

Almost equal number of the parents, 13 (43.3%) in control group and 15 (50%) in experimental group were graduates.

Majority of the supporting person during immunization, 25 (83.3%) in control group and 27 (90%) in experimental group were mothers.

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SECTION II

This section deals with the percentage distribution of level of pain during immunization among infants in control group and experimental group.

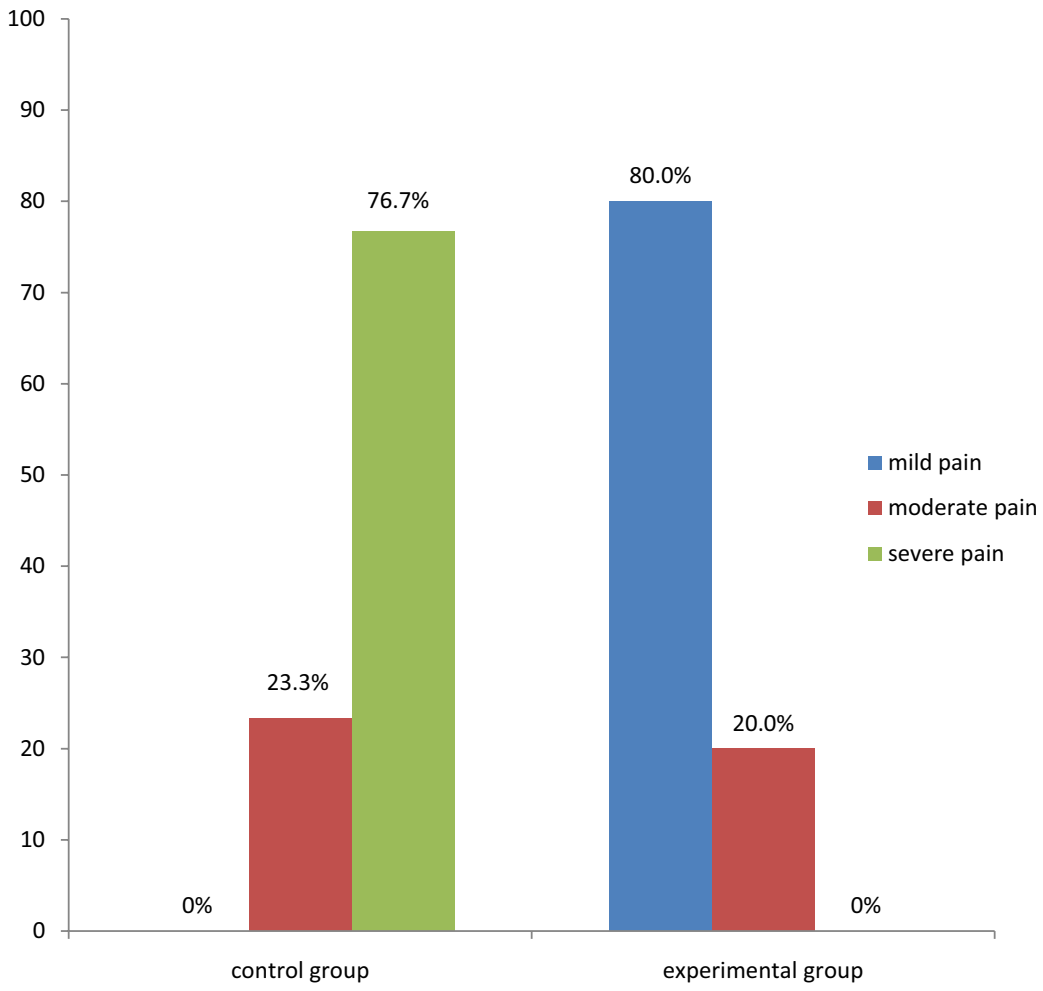

Figure-2 the percentage distribution of level of pain during immunization among infants in control group and experimental group.

SECTION III

This section deals with the comparison of mean scores between control group and experimental group.

Table-2

Comparison of mean scores between control group and experimental group

S.No	Group	Sample (n)	Pain scores		Independent 't' test
			Mean	SD	
1	Control group	30	2.77	0.430	14.493**
2	Experimental group	30	1.20	0.407	

** $p<0.01$ level

Table-2 shows comparison of mean scores between control group and experimental group. The calculated 't' value was more than the table value (2.66) at 0.01 level, which implies that there was a significant decrease at $p<0.01$ level. So the research hypothesis H_1 was accepted.

SECTION IV

This section deals with the association between demographic variables with the level of pain in control group

Table- 3

S.No	Demographic Variables	Control Group (n=30)		
		Moderate pain	Severe pain	Chi-Square
1.	Age			
	a. $1^{1/2}$ months	2	8	
	b.2 $^{1/2}$months	2	8	0.373
	c.3 $^{1/2}$months	3	7	
2.	Gender			
	a.Male	4	8	1.118
	b.Female	3	15	
3.	Gestational Age At Birth			
	a.<37weeks	2	1	3.499
	b.>37weeks	5	22	
4.	Birth Weight			
	a.<2.5 kilograms	0	0	0.00
	b.>2.5 kilograms	7	23	
5.	Birth Order			
	a.1st child	4	9	
	b.2nd child	3	12	1.104
	c.3 rd and above	0	2	
6.	Present Weight			
	a. Normal	6	22	
	b. Underweight	0	1	3.647
	c. Overweight	1	0	

7.	Type Of Feeding			
	a.Breast Feeding	5	9	
	b.Formula Feeding	0	8	3.647
	c.Both	2	6	
8.	Status of the Baby			
	a.Awake	5	22	3.499
	b.Sleeping	2	1	
9.	Parent Education			
	a.Illiterate	1	3	
	b.Higher Secondary	3	10	0.007
	c.Degree	3	10	
10.	Supporting Person			
	a.Mother	5	20	
	b.Father	1	2	1.118
	c.Others	1	1	

*p<0.05 level

Table- 3 shows the association between demographic variables with the level of pain in control group. The calculated chi-square values imply that there was no association between selected demographic variables with the level of pain in control group. So the research hypothesis H_2 was rejected.

SECTION V

This section deals with the association between demographic variables with the level of pain in experimental group

Table-4

S.No	Demographic Variables	Experimental Group (n=30)		
		Mild pain	Moderate pain	Chi-Square
1.	Age			
	a. $1^{1/2}$ months	4	5	
	b.2 $^{1/2}$months	7	0	10.308*
	c.3 $^{1/2}$months	13	1	
2.	Gender			
	a.Male	13	3	0.033
	b.Female	11	3	
3.	Gestational Age At Birth			
	a.<37weeks	2	1	0.370
	b.>37weeks	22	5	
4.	Birth Weight			
	a.<2.5 kilograms	0	0	0.00
	b.>2.5 kilograms	24	6	
5.	Birth Order			
	a.1st child	7	3	
	b.2nd child	14	3	1.434
	c.3 rd and above	3	0	
6.	Present Weight			
	a. Normal	22	6	
	b. Underweight	1	0	0.536
	c. Overweight	1	0	

7.	Type Of Feeding			
	a.Breast Feeding	10	4	
	b.Formula Feeding	4	1	1.461
	c.Both	10	1	
8.	Status of the Baby			
	a.Awake	23	5	1.205
	b.Sleeping	1	1	
9.	Parent Education			
	a.Illiterate	4	2	
	b.Higher Secondary	7	2	1.111
	c.Degree	13	2	
10.	Supporting Person			
	a.Mother	23	4	
	b.Father	1	1	5.579
	c.Others	0	1	

*p<0.05 level

Table- 4 shows the association between demographic variables with the level of pain in experimental group. The calculated chi-square values imply that there was a significant association between selected demographic variable only in age of the infant ($\chi 2=10.308$) with the level of pain in experimental group. So the research hypothesis H_3 was accepted.

CHAPTER V

DISCUSSION

This chapter deals with the findings of the study. The study was done to assess the effectiveness of oral glucose on level of pain during immunization among infants at Child Health Clinic, Trichy.

A true experimental post test only design was used to conduct the study, level of pain during immunization among infants was measured by using Neonatal Infant Pain Scale (NIPS). Probability simple random sampling technique was used. The study sample consisted of 60 infants, 30 in control group and 30 in experimental group. Using the above tool, data were collected and analyzed. The study findings revealed the following.

Among the demographic variables equal number of the infants, 10 (33.3%) was there in each age group in control group and 14 (46.7%) in experimental group belong to age of 31/2 months. Most of the infants, 18 (60%) in control group were female and 16 (53.3%) in experimental group were male. Equal number of infants, 27 (90%) in control group and experimental group were more than 37weeks of gestation at birth. All the infants, 30 (100%) in control group and experimental group were more than 2.5kilograms at birth. Almost equal number of infants, 15 (50%) in control group and 17 (56.7%) in experimental group were 2nd child to their parents. Equal number of infants, 28 (93.3%) in control group and experimental group was having normal weight. Equal number of infants, 14 (46.7%) in control group and experimental group were on breast feeding. All most equal number of infants, 27 (90%) in control group and 28 (93.3%) in experimental group were awake during immunization. Almost equal number of the parents, 13 (43.3%) in control group and 15 (50%) in experimental group were graduates. Majority of the supporting person during immunization, 25 (83.3%) in control group and 27 (90%) in experimental group were mothers.

The first objective of the study was to assess the level of pain during immunization among infants in control group.

The results of this study showed that 7 (23.3%) of the infants had moderate pain, 23 (76.7%) infants had severe pain and none of them came under mild pain category in control group. The results of the study indicated that infants in control group had moderate and severe level of pain during immunization. The reason for this result was that the infants who were not receiving oral glucose will have pain perception as indicated by increased pain score. This finding was supported by Barclay L. (2010).

The second objective of the study was to evaluate the effectiveness of oral glucose administration on level of pain during immunization among infants in experimental group.

The results of this study showed that 24 (80%) infants had mild pain, 6(20%) infants had moderate pain and none of them came under severe pain category in experimental group. The results of the study indicated that infants in experimental group had only mild and moderate level of pain during immunization. The reason for this result was infants who were receiving intervention oral glucose administration perceived only less pain, because it improves the emotional security and reduces the pain perception in infants. Pain perception was very less in infants who received intervention. These findings were supported by Suhrabi Z., Taghinejad H., Valian K., Sayehmiri K. and Taheri S. (2014).

The third objective of this study was to compare the level of pain during immunization among infants in control group and experimental group.

The infants receiving oral glucose had significantly lower mean pain scores during immunization 1.20 than those not receiving intervention 2.77. The finding showed that the calculated 't' value was more than the table value at $p < 0.01$ level which implies that there was significant decrease on

level of pain among infants in the experimental group as compared to control group. The reason for this result was that infants in experimental group perceived only mild and moderate pain after oral glucose administration but infants in control group perceived moderate and severe pain during immunization, without any intervention. These findings were supported by Ramya S (2011). Hence the stated research hypothesis H_1 was accepted.

The fourth objective of this study was to determine the association between selected demographic variables with the level of pain during immunization among infants in control group.

Chi-square value implies that there was no association between selected demographic variables with the level of pain in control group. These findings were supported by Kavitha S (2015). So the stated research hypothesis H_2 was rejected.

The fifth objective of this study to determine the association between selected demographic variables with level of pain during immunization among infants in experimental group.

Chi-square value implies that there was a significant association between selected demographic variable only age of the infants ($\chi 2 = 10.308$) with level of pain in experimental group. These findings were contradicted by Nanthini (2014).So the stated research hypothesis H_3 was accepted.

CHAPTER VI

SUMMARY, CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

This chapter presents the summary of the study, conclusion, implications in different areas like nursing practice, nursing education, nursing research, nursing administration, limitations and recommendation for the further study.

SUMMARY OF THE STUDY

A true experimental study to assess the effectiveness of oral glucose on pain during immunization among infants at Child Health Clinic, Trichy.

THE FOLLOWING OBJECTIVES WERE SET FOR THE STUDY

1. To assess the level of pain during immunization among infants in control group.
2. To evaluate the effectiveness of oral glucose administration on level of pain during immunization among infants in experimental group.
3. To compare the level of pain during immunization among infants in control group and experimental group.
4. To determine the association between selected demographic variables with level of pain during immunization among infants in control group.
5. To determine the association between selected demographic variables with level of pain during immunization among infants in experimental group.

The conceptual model of the study was based on the Ernestine Weidenbach's prescriptive theory. The study was conducted by using true experimental post test only design. Probability Simple random sampling was used to select the study sample. The sample size used for the study was 60

infants 30 in control and 30 in experimental groups. The instruments used for data collection was Neonatal Infant pain scale.

The data was analyzed and interpreted in terms of objectives and research hypothesis. Descriptive statistics (Frequency, percentage, mean and standard deviation) and inferential statistics (independent t-test and chi-square) were used to test the research hypothesis.

MAJOR FINDINGS OF THE STUDY

1. Majority of the infants belong to the age group of 3 $^{1/2}$ months.
2. Most of the infants in control group were female and most of the infants in experimental group were male.
3. Majority of the infants in control group and experimental group were more than 37weeks of gestation at birth.
4. All the infants in control group and experimental group were more than 2.5kilograms at birth.
5. Majority of the infants in control group and experimental group were 2nd child to their parents.
6. Majority of the infants in control group and experimental group was having normal weight.
7. Majority of the infants in control group and experimental group were on breast feeding.
8. Majority of the infants in control group and experimental group were awake during immunization.
9. Majority of the parents, in control group and experimental group were graduates.

10. Majority of the supporting person during immunization in control group and experimental group were mothers.

11. In the present study results showed that infants in control group had moderate and severe level of pain during immunization.

12. In the present study result showed that infants in experimental group had only mild and moderate level of pain during immunization.

13. The infants receiving oral glucose had significantly lower mean pain scores during immunization than those not receiving intervention. The finding showed that the calculated‘t’ value was more than the table value and significant at $p<0.01$ level.

14. There was no significant association between selected demographic variables with level of pain in control group at $p<0.05$ level.

15. There was a significant association between selected demographic variables with level of pain in experimental group at $p<0.05$ level.

CONCLUSION

The study brought out the following conclusions that Oral glucose administration improves the emotional security and reduces the pain perception in infants. Oral glucose administration is the simplest non pharmacological and cost effective technique which makes the infant comfortable, more secure with controlled response. Oral glucose administration was a safe, non invasive, and inexpensive, and independent nursing function.

IMPLICATIONS

The findings of the study have several implications on nursing practice, nursing education, nursing research and nursing administration.

NURSING PRACTICE

Numerous implications can be drawn from the present study for practice which promotes and creates a new dimension to nursing profession. The study findings will create awareness among nurses that pain assessment is a basis of pain reduction. Nurses must be trained to assess the level of pain. Nurses must enlighten their knowledge about the importance of non-pharmacological measures to reduce the level of pain during painful procedures. This will help them to have control over the immunization pain.

Nurses can utilize the evidenced based practice in improving the quality and standards of nursing care. This study brings a positive effect on immunization. To make significant contributions and to promote overall well being of the immunized child. Oral glucose solution can be easily incorporated into clinical practice without the additional cost or time.

NURSING EDUCATION

The practical knowledge of the nurse depends upon the education they receive, so the nursing education should prepare the nurses to realize their responsibility as nurse educator has to render health services in various settings like community, schools, family, industry, hospitals and primary health services. Pain is considered as fifth vital signs. So both the teachers and students can involve themselves and encourage practicing pain assessment tools and non-pharmacological measures for the reduction of pain. Orientation can be given to all new staffs on the use of oral glucose in pain reduction. In-service education can be given to the nursing personnel regarding the

importance of non-pharmacological measures in pain reduction and use of oral glucose.

To conduct seminars, workshops, conferences, symposiums and micro teaching programs regarding the use of oral glucose solution on procedural pain to educate nursing personnel. The present study will help nursing students to understand the advantages and importance of oral glucose administration during immunization. The results will be used as an example by the nurse educators in the class rooms while giving instructions on immunizations. This also helps the nursing students to understand the needs of infants during immunization and to implement oral glucose administration during immunization.

NURSING RESEARCH

Extensive researches can be conducted in various settings regarding oral glucose administration to identify the efficacy, feasibility and acceptability. And the study can be done during any clinical procedures and painful investigations. Oral glucose may be studied more scientifically and use an evidenced based nursing interventions

The present study will help the future nurse researchers to carry out further studies in determining the extent to which oral glucose can reduce procedural pain. The study findings will also help the nurse researcher in studying the constraints and barriers in providing oral glucose administration during immunization.

NURSING ADMINISTRATION

The present study will help the nurse administrators to understand the importance of the administration of oral glucose solution during immunization. It is effective in terms of man, money, time and materials. Nurse administrators can develop nursing practice standards, protocols and materials on pain assessment and pain management during procedural pain, in which oral glucose solution can be included as an important strategy to relieve pain.

Continuous nursing education programmes can be planned by the nurse administrator for nurses' especially pediatric nurse practitioners regarding the use of oral glucose solution to update their knowledge and skills in managing pain during immunization among infants.

LIMITATION

1. Double blinding was not used for this study.

RECOMMENDATIONS

1. A true experimental study can be conducted by using on a larger sample to generalize the study findings.
2. A true experimental study can be conducted on other age groups undergoing painful procedures.
3. A comparative study can be done to assess the effectiveness of different concentration of glucose solution.
4. A study can be done to assess the effectiveness of self instructional module regarding oral glucose administration in pediatric ward.
5. A comparative study can be done to compare the effectiveness of oral glucose and other non-pharmacological measures in reduction of pain.

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APPENDIX A

a) LETTER REQUESTING FOR VALIDATION

From

Mrs Namitha Munipass,
II Year M.sc nursing,
Dr.G.Sakunthala College of nursing,
Trichy.

To

Through

The Principal,
Dr.G.Sakunthala of Nursing, Trichy.

Respected madam,

Sub : req. opinion and suggestion from experts for establishing content validity of the tools

I am a II year M.sc nursing student of Dr.G. Sakunthala College of nursing. As a partial fulfilment of my requirements I am doing a study on the topic mentioned below.

"A true experimental study to assess the effectiveness of oral glucose therapy on level of pain during immunization among infants at selected immunization clinic, Trichy."

May I hereby humbly request you to give your valuable suggestion regarding the appropriateness of the tool. Your kind co operation and judgement will be highly appreciated

Thanking you in anticipation

Yours Faithfully,

(NAMITHA MUNIPASS)

b) LETTER SEEKING PERMISSION TO CONDUCT THE RESEARCH STUDY

From

The principal,
Dr. G. Sakunthala College of Nursing,
Trichy-5.

To

Dr. K Ramanathan M.D(Pediatrics),
Pediatrician and Neonatologist,
Child Health Clinic,
Trichy.

Respected Sir,

Sub: Requesting permission to conduct study.

This is to introduce Ms.Namitha Munipass, IIyear M.Sc(N) student of Dr.G. Sakunthala College of Nursing, Trichy. She is to conduct a research project which is to be submitted to Dr.M.G.R. Medical University in partial fulfilment of University requirement for the award of Master degree of Nursing.

Topic: A true experimental study to assess the effectiveness of oral glucose on pain during immunization among infants at Child Health Clinic, Trichy.

I shall be obliged if you kindly grant permission for conducting her study in your Child Health Clinic.

Thanking you,

Yours Sincerely

(PRINCIPAL)

APPENDIX B

LIST OF EXPERTS CONSULTED FOR THE CONTENT VALIDITY OF RESEARCH TOOL

Mrs. AMBIKA, M.Sc (N),
Reader,
HOD of Dept of Pediatrics,
Our Lady College of Nursing,
Thanjur.

Mrs.Vani Chitra Devi, MSc (N),
Vice Principal,
Karpaga Vinayaga College of Nursing,
Pudukkottai

Prof. Ms Mariyammal Pappu, M.Sc (N)
H.O.D Peadiatric Nursing Dept,
K.M.C.H College of Nursing,
Avinashi Road,
Coimbatore-641014.

Prof. Ms Mahalakshmi, M.Sc (N)
Peadiatric Nursing Dept,
K.M.C.H College of Nursing.

Prof. Ms R.Sasikala,MSc(N)
Asst.Prof,Peadiatric Nursing Dept,
K.M.C.H College of Nursing,
Coimbatore-641014.

APPENDIX C

RESEARCH INSTRUMENTS

PART -1

DEMOGRAPHIC VARIABLES

1. Age

a. 1 $^{1/2}$months ( )

b. 2 $^{1/2}$months ( )

c. 3 $^{1/2}$months ( )

2. Gender

a. Male ( )

b. Female ( )

3. Gestational Age At Birth

a. <37 weeks ( )

b. >37 weeks ( )

4. Birth Weight

a. <2.5kilograms ( )

b. >2.5kilograms ( )

5. Birth Order

a. 1st child ( )

b. 2nd child ( )

c. 3rd and above ( )

6. Present Weight

a. Normal ( )

b. Under weight ( )

c. Over weight ( )

7. Type Of Feeding

a. Breast feed ( )

b. Formula feed ( )

c. Both ( )

8. Status Of The Child

a. awake ( )

b. sleeping ( )

9. Parent’s Education

a. Illiterate ( )

b. Higher Secondary ( )

c. Degree ( )

10. SUPPORTING PERSON

a. Mother ( )

b. Father ( )

c. Others ( )

PART II

NEONATAL INFANT PAIN SCALE		
PARAMETER	FINDING	POINTS
Facial Expression	Relaxed	0
	Grimace	I
Cry	No cry	0
	Whimper	I
	Vigorous crying	2
Breathing Patterns	Relaxed	0
	Change in breathing	I
Arms	Restrained	0
	Relaxed	0
	Flexed	I
	Extended	I
Legs	Retrained	0
	Relaxed	0
	Flexed	I
	Extended	I
State of Arousal	Sleeping	0
	Awake	0
	Fussy	I

NIPS Interpretation

No pain : 0-2

Mild pain : 3-4

Moderate pain : 5-6

Severe pain : >6